

REMARKS/ARGUMENTS

In this Amendment, Applicants have amended independent claim 1 to more particularly claim Applicants' invention. Claim 1 now more particularly claims that with the total reflection/transmission type beam combining means, which comprises a first triangular prism with a first inclined plane and a second triangular prism with a second inclined plane, the optical paths of two of the beam splits incoming from two directions almost perpendicular to each other are aligned in essentially the same direction by the total reflection/transmission type beam combining means. Thus, as now more particularly claimed, two incoming perpendicular beams are aligned in the same direction by the total reflection/transmission type beam combining means. The total reflection/transmission type beam combining means is able to do this because it includes the first and second triangular prisms, as claimed. As will be further discussed below, Applicants respectfully submit that even if Hongo can be interpreted as including a total reflection/transmission type beam combining means and polarizing type beam combining means, and even if Hongo could be modified to include the beam "splitting" prisms of Yoshida, Hongo still does not disclose two perpendicular beams that are incident on the total reflection/transmission type beam combining means such that the two perpendicular beams are aligned in the same direction by the combining means. Hongo does not, and cannot, disclose this because Applicants' total reflection/transmission type beam combining means has a totally different purpose than the beam-homogenizer 8 of Hongo. As such, Applicants respectfully submit that amended claim 1 is allowable over the cited references.

As discussed above, in Applicants' invention, as disclosed in at least para. 0033 and Figure 1 of Applicants' published application, the beam combining means 31c is used as a combining type apparatus. The beam combining means transmits the beam A, incident from the left side of the drawing, and reflects the beam B, incident from the lower side of the drawing, to the right side of the drawing. Thus, perpendicular incident beams A and B are aligned in a same

direction by the beam combining means 31c. Paras. 0016-0019 of Applicants' published application describe how the two triangular prisms of the total reflection/transmission type beam combining means allow for the beam combining means to operate as a combining type apparatus in the present invention "where beams incoming from two directions almost perpendicular to each other are made to outgo in one direction by the beam combining means [31c]..." See para. 0019.

Applicants respectfully submit that Hongo does not disclose a total reflection/transmission type beam combining means where two incident perpendicular beams are aligned in a same direction by the combining means. Further, Applicants respectfully submit that even if Hongo could be modified by Yoshida such that two prisms could be included in Hongo, Hongo would still not disclose Applicants' claimed invention.

In the Office Action, the Examiner argues that Hongo discloses a laser system "which meet applicant's [sic] claimed total reflection/transmission type beam combining means and polarizing type beam combining means..." The Examiner directed Applicants' attention to Figures 1 and 9 and col. 7, line 66 through col. 8 in Hongo. However, the Examiner has not particularly pointed out what structures in Hongo the Examiner believes discloses Applicants' claimed total reflection/transmission type beam combining means and polarizing type beam combining means. Applicants assume that the Examiner is arguing that the beam-homogenizer 8, with the fly eye lens 81 and convex lens 82, discloses these features of Applicants' invention. However, even if the Examiner is arguing that these structures disclose Applicants' total reflection/transmission type beam combining means and polarizing type beam combining means, Applicants respectfully submit that neither the beam-homogenizer 8, nor fly eye lens 81, convex lens 82, nor any other structure that could be included in beam-homogenizer 8, disclose Applicants' invention where two perpendicular incident beams are aligned in the same direction by the total reflection/transmission type

beam combining means. This is so because the purpose of Hongo's beam-homogenizer is totally different from Applicants' beam combining means.

In Hongo, the gas laser or solid state laser normally has a Gaussian energy distribution as shown in Figure 9. However, whereas a uniform energy distribution can be attained by extracting only the comparatively uniform portion in the center, the peripheral portion of the beam is eliminated and a large part of the energy is wasted. To resolve this problem, the beam-homogenizer 8 is used to convert the Gaussian distribution of the laser beam into a uniform distribution. Thus, in Hongo, a laser beam having a Gaussian distribution can be converted to a laser beam having a uniform energy distribution. There is no disclosure in Hongo, nor is there any reason that such a disclosure should be included in Hongo, for combining two perpendicular beams incident on a total reflection/transmission type beam combining means such that the two incident perpendicular beams are aligned in the same direction by the beam combining means, as claimed by Applicants. Thus, for at least this reason, Applicants respectfully submit that claim 1 is allowable.

Further in the Office Action, the Examiner appears to be arguing that it would have been obvious to use the "beam splitting apparatus" of Yoshida, comprising two polarizing prisms, in Hongo. However, the Examiner has not argued how this "beam splitting apparatus" of Yoshida could be incorporated into Hongo. The Examiner appears to argue that since Hongo describes "fly eye lens beam splitting" and also mentions a "prism", that the beam splitting apparatus of Yoshida could be somehow substituted for the fly eye lens of Hongo.

First, Applicants respectfully submit that the fly eye lens of Hongo is not used for "beam splitting". As discussed above, the fly eye lens of Hongo is used in a beam-homogenizer to convert the Gaussian distribution of a laser beam into a uniform distribution. Therefore, there would be no motivation to substitute the "beam splitting apparatus" of Yoshida for the fly eye lens Gaussian distribution converter of Hongo. Such a beam splitter of Yoshida could not perform the required function of the fly eye lens of Hongo.

Secondly, any mention of a “prism” in Hongo is not in connection with a beam splitting operation itself. In Hongo, the disclosure at col. 8, lines 43-45, means that the laser beam is split into a plurality of beams and by means of a prism, these beams are overlapped with each other and mixed so as to obtain a harmonized beam. Thus, there is no explanation or suggestion at all in Hongo regarding splitting a beam by means of a prism. Therefore, Applicants respectfully submit that Hongo’s mention of a prism cannot be a basis for the Examiner’s argument that it would have been obvious to include the beam splitting prisms of Yoshida in Hongo.

Applicants respectfully request that if the Examiner disagrees with Applicants’ arguments, that the Examiner particularly point out in Hongo what structures the Examiner believes discloses Applicants’ claimed total reflection/transmission type beam combining means and polarizing type beam combining means, and what structure in Hongo is specifically modified by Yoshida such that fixed beam splitting prisms are included in Hongo.

In Applicants’ invention as claimed, a total reflection/transmission type beam combining means is used which comprises a first triangular prism with a first inclined plane and a second triangular prism with a second inclined plane. This structure is used because the optical paths of two of the beam splits incoming from two directions almost perpendicular to each other are aligned in essentially the same direction by the total reflection/transmission type beam combining means. Hongo, either alone or in combination, does not disclose such a structure. In Hongo, a laser beam having a Gaussian distribution can be converted to a laser beam having a uniform energy distribution. Hongo does not disclose the beam paths as claimed by Applicants; Hongo’s beam-homogenizer does not receive two perpendicular incident beams. Hongo’s beam-homogenizer has a totally different function than Applicants’ claimed total reflection/transmission type beam combining means, and thus, has a totally different structure. There would be no motivation to modify the structure of Hongo to include a first triangular prism with a first inclined plane and a second

triangular prism with a second inclined plane, even if Yoshida discloses such a structure, because Yoshida's structure is used for beam splitting, not beam combining, and Hongo conditions a Gaussian laser beam rather than aligns perpendicular incident beams in the same direction. Applicants also respectfully submit that Yoshida does not disclose two incident perpendicular beams.

Applicants also respectfully submit that neither Lizotte nor Sakamoto remedies any of the deficiencies discussed above, since the Examiner only appears to be using these references for providing beam splits to a workpiece.

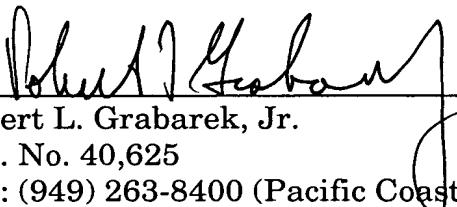
Therefore, Applicants respectfully submit that the application is now in condition for allowance with claims 1-3 being allowable. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

As provided for above, this Paper should be considered as a Petition for an Extension of Time sufficient to effect a timely response. Please charge any deficiency in fees, or credit any overpayment of fees, to Deposit Account No. 05-1323 (Docket No. 029116.53329US).

Respectfully submitted,

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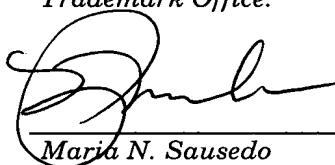
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